a stiff, visible pellicle, composed, as it appears, of small incoherent particles.

Certain peculiarities of some substances still must be mentioned.

(1) The contamination due to colophony and palmitic acid continually diminishes, and at last seems to disappear altogether on standing, which is not the case with mastic.

(2) On the other hand, if the surface has been for a moment in contact with a piece of soap, the contamination continues to increase after the removal of the soap.

(3) Stearic acid renders the water surface stiff as soon as the tension begins to sink.

(4) A surface made anomalous by olive-oil in the course of twenty-four hours undergoes a change, by which the curve of tension is totally altered.

On the whole the phenomena are rather complicated, the tension by no means being determined by the quantity of contaminating substance in the unit of area; but depending considerably upon conditions that are still to be investigated. Especially in the experiments relative to the final tensions attainable by the various substances in the state of utmost concentration I could not succeed in getting definite results.

AGNES POCKELS.

NOTES.

A BRONZE statue of Arago, erected in the grounds behind the Paris Observatory, was unveiled by M. Poincaré on Sunday last in the presence of several members of the Institute, the observatory officials, and a few spectators. This is the third monument that has been erected to the memory of that renowned astronomer.

PROF. MAX MÜLLER has had the order of Medjidieh conferred on him by the Sultan of Turkey. This is a graceful recognition of Prof. Müller's scientific researches.

BARON VON NORDENSKJÖLD, of Stockholm, has been elected a Foreign Member of the Paris Academy of Sciences.

DR. E. B. TYLER, Curator of the Oxford University Museum, has been elected an Associate of the Brussels Academy of Sciences.

THE announcement that Mr. E. B. Poulton, F.R.S., has been appointed Hope Professor in succession to the late Prof. Westwood will be received with satisfaction by all naturalists who are familiar with this author's work. For more than ten years Mr. Poulton has displayed the greatest activity as an original investigator, more especially in connection with the subject of insect colouration, which he has advanced by many important discoveries. His contributions to insect morphology are sufficient guarantee that the purely systematic side of entomology will not be neglected at Oxford. All who are interested in the status of the University as a centre of biological research will recognise the wisdom of the electors in making their selection.

IN the House of Commons on June 8 Mr. Rentoul asked the Secretary of State for War whether he was aware that at the recent Staff College examination there was a striking change, of which no notice had been given, in the nature and scope of the mathematical examination; and whether steps would be taken to prevent any of the officers who were candidates at the examination being disqualified in consequence of this unusual procedure. Mr. Campbell Bannerman replied that the change was due to the appointment of a new examiner, and said that, as the examination is competitive, the candidates would not be put to any disadvantage by the greater difficulty of the questions. This may be a sufficient explanation of the circumstance, but, in many cases, candidates for Government appointments have found upon reading the question paper, that important changes have been made in the character of the examination without any intimation whatever having been given to them.

A *conversazione* of the Institution of Electrical Engineers will be held in the galleries of the Royal Institute of Painters in Water Colours on Friday evening, June 23.

THE Selborne Society have made arrangements for a visit to Selborne, the home of Gilbert White, on Saturday, June 24. Lord Selborne will occupy the chair at lunch, and be supported by Lord Northbrook, the Earl of Stamford, and Sir John Lubbock, Bart. Tickets for the excursion can be had from the Secretary, 9, Adam Street, Adelphi, W.C.

THE fourth annual meeting of the Museums' Association will be held in the rooms of the Zoological Society during the first week in July. The formal proceedings will commence on Monday, July 3, at 8.30 p.m., when Sir W. H. Flower, F.R.S., the President-Elect, will deliver an address. It is proposed to devote mornings to the reading and discussion of papers bearing upon the subject of museums, and in the afternoons and evenings visits will be made to various Metropolitan museums. The arrangements of the meeting will be greatly facilitated if those who propose to attend will give early notice to Mr. F. W. Rudler, 28, Jermyn Street, S.W.

THE fifth summer assembly of the National Home Reading Union will be held at Ilkley, Yorkshire, from July 1 to July 8. The inaugural address will be delivered by the Master of Trinity College, Cambridge, and there will be lectures by Mrs. Henry Fawcett, Prof. Michael Foster, Sir Robert Ball, Mr. W. G. Collingwood, Mr. Churton Collins, and others. Short lectures on archæology, botany, and geology will be given each day, and will be followed by excursions to places of interest in the neighbourhood. There could hardly be a more pleasant road to knowledge than that afforded by such a meeting as this.

VARIOUS learned and scientific bodies of Liverpool and the district, being desirous of inviting the British Association to meet at Liverpool in 1896, sent representatives to the Mayor on June 5 for the purpose of soliciting his aid in the furtherance of their object. The Mayor would not pledge himself to any course of action, but said he would consult the Corporation upon the matter.

THE Permanent Committee of the International Congress of Zoology propose, as the subject for the S. A. I. le Tsarévitch prize, the study of the fauna of one of the great regions of the globe and the relations between this fauna and that of neighbouring regions. The award will be made at the Leyden Congress in 1895. By the rules of the Congress this prize cannot be given to a Dutch man of science. The jury will accept works bearing upon a branch or a class of the animal kingdom. Manuscripts or printed papers should be written in French and sent, before May 1, 1895, to M. le Président du Comité permanent, Société Zoologique de France, 7 Rue des Grands-Augustins, Paris.

WITH the exception of heavy thunderstorms which occurred in the central part of Ireland during the night of Friday, the 9th inst., in which 1·2 inch of rain fell, and in Merioneth the next day, the weather, as represented by the stations reporting to the Meteorological Office, has been practically rainless over nearly the whole of the British Islands. These conditions were owing to the persistence of an anticyclone over Scandinavia, the North Sea and our own area. The temperature has been somewhat high for the time of year, the highest daily maxima in the south and west having at times exceeded 75°; but in the north, and especially on the east coast, owing to the continuance of easterly winds, many of the maximum readings have been below 60°. During the early part of the present week the anticyclone decreased in intensity and began to move slowly eastward, while a depression which lay over the south-west of France moved northward, causing the barometer to fall generally over our islands, and on Tuesday night, the 13th inst., a thunderstorm occurred at Jersey, while a further rise of temperature occurred over the southern portion of the kingdom, the maximum at Cambridge reaching 81°. The *Weekly Weather Report* of the 10th inst. showed that the greatest excess of temperature occurred in Ireland and the Channel Islands, where it was 5° above the mean. The rainfall just equalled the mean in the east of Scotland and the north of Ireland only. Bright sunshine was above the usual amount everywhere; the percentage of duration ranged from 29 to 38 in Scotland, from 36 to 40 in Ireland, and from 40 to 67 over England, while in the Channel Islands the percentage was as high as 75 of the possible amount.

WE are indebted to Dr. A. Buchan for the discussion and publication (in vol. ix. of the Journal of the Scottish Meteorological Society) of a very valuable series of mean monthly and yearly temperatures for London and vicinity for 130 years, from 1763 to 1892. The only interruptions of the continuity of this long series occurred in May 1777 and July 1780, and the means for these months have been interpolated. For the 130 years the mean temperature of London is 50°·2. The highest mean temperature of any month was 74°·1 in July 1783, and the lowest 25°·9 in January 1795, the difference being 48°·2. The warmest seasons were, winter, 1779, 8°·3 above the normal value; spring, 1811, + 5°·2; summer, 1783, + 8°·2; and autumn, 1777, + 5°·1. The coldest seasons were, winter, 1814, 6°·5 below the normal; spring, 1837, − 6°·7; summer, 1816, − 4°·6; and autumn, 1877, − 4°·1. The year 1783 had the highest mean annual temperature, being 5°·2 above the normal for the year; and 1816, the lowest, being 3°·5 under the normal. Dr. Buchan states that much labour has been spent in searching for evidence of cycles, but that it cannot be said that the results show more than highly interesting resemblances and contrasts among the months, and that in whatever way the periods are viewed, they suggest no appearance of a cycle. But a tendency is shown of types of high and low temperature to prolong themselves during months, seasons, and years. Following this paper is an equally important discussion by the same author of the temperature of the north-east of Scotland for 129 years, from 1764 to 1892, from observations taken at Gordon Castle and other places.

AT the instance of Herr von Helmholtz, and with the support of the Berlin Academy of Sciences, Drs. Franz Richarz and Otto Krigar-Menzel have undertaken a remarkable series of experiments for the purpose of determining by weighing the diminution of gravity as we ascend from the surface of the earth. The method was theoretically the following:—To each pan of an ordinary balance is attached another pan by means of a rod about 2 m. long. Two sensibly equal masses are placed in the left upper and the right lower pan respectively. The gravitational attraction being stronger on the latter weight, a difference will be indicated by the balance. On removing the left weight from the upper to the lower pan, and the right weight from the lower to the upper, the difference acts in the opposite direction, and half the mean of the two differences gives the decrease of gravity with the height. It is almost needless to say that the experiment was one of very great delicacy and difficulty. It was performed in an earth-covered casemate of the citadel of Spandau, partly in order to utilise a mass of lead weighing about a hundred tons to determine the attraction exerted by it. The necessary preparations were begun in 1887, and the main part of the observations has only just been concluded. The difference between the values of g at two points, one 2·26 m. above the other, was found to be $6·523 \times 10^{-6}$. The calculated value was $6·970 \times 10^{-6}$. The difference may be due to a density of the strata below the station being less than the average.

A THERMOSTAT for the comparison of standard thermometers between the temperatures of 50° and 300° C. is described by Herr A. Mahlke in the current number of the *Zeitschrift für Instrumentenkunde.* It is used at the Physikalisch-Technische Reichsanstalt for the purpose of maintaining the thermometers to be compared at certain temperatures for which the boiling point of some substance is not available. It consists essentially of an oil-bath in a copper cylinder surrounded by another copper cylinder, the space between the two being filled with air. Heat is applied to the outer vessel. The heated air warms the inner vessel by circulating round it, there being a clearance of 2 or 3 cm. all round. Special precautions are taken to keep the level of the oil in the inner vessel constant, and the temperature of the oil uniform throughout. Both cylinders are closed with lids containing holes through which to insert the thermometers. The oil is kept circulating by means of two propellers enclosed in vertical copper cylinders open at both ends. Their axes project through the outer lid, and are provided with pulleys rotated by means of a small water motor. The whole arrangement is designed to keep the entire body of oil in motion, so as to prevent unequal heating. Surplus oil, due to expansion, and any oil-vapour that may be evolved, are drawn off through a siphon leading through the walls of the cylinders into a refrigerator. The apparatus has worked very well, the variations of temperature not exceeding the average errors in reading the thermometer scales.

THE extremely high cost of high resistances made of metallic wire causes the discovery of a cheap substitute to be a matter of considerable importance. Most of the substitutes hitherto proposed, such as liquid resistances, pencil marks on glass or ebonite, &c., are subject to the objection that they have an extremely high temperature coefficient, and in the case of the pencil mark, on account of the extreme thinness of the conducting material, the rubbing off of a few particles causes a great increase of resistance. These resistances also depend in a considerable degree on the electromotive force to which they are subjected. The *Elettricista* for May contains the description of a new material for the construction of high resistances, discovered by E. Jona which is said to be free from most of these defects. He uses an ebonite tube which is filled with a mixture of graphite and unvulcanised ebonite in suitable proportions. The mixture is then vulcanised, when it hardens and adheres to the containing tube. Metal cups fitted with binding screws are fixed to the ends. In this way a resistance of a megohm can easily be obtained in a tube 10 cm. long and of 15 mm. diameter.

IN a recently-published number of the proceedings of the Cambridge Philosophical Society there is an interesting paper by Messrs. Griffiths and Clark on the determination of low temperatures by means of platinum thermometers. Acting on the suggestion of Profs. Dewar and Fleming, that from observations on the resistance of certain pure metals (including platinum) at very low temperatures, it would appear as if the resistance vanished at absolute zero, the authors have calculated by means of Callendar and Griffiths' method the temperature at which the resistance of several platinum thermometers, whose accuracy had been severely tested, would be zero. The values obtained seemed to corroborate the conclusions arrived at by Profs. Dewar and Fleming as the mean value found for the temperature at which the resistance would be zero is − 273°·96. This gives a convenient method of graduating a platinum thernometer, when a high order of accuracy is unnecessary, without the usual observation in sulphur vapour, which, in the absence of special apparatus, is a troublesome operation. For if the platinum is pure, it may be assumed that at absolute zero the resistance vanishes, and thus a measure of the resistance in steam and ice will allow of its constants being calculated.

WHILE making the observations mentioned in the previous note the authors were led to suspect that the heating effect of the small currents necessary to measure a resistance are of more importance than is usually supposed. During their determination of the value of the mechanical equivalent of heat by means of an electric current, they measured the temperature of the bath containing the wire under experiment, at which the resistance was the same, while the difference of potential at the ends was increased from one to ten volts. Hence they were able to calculate the change of resistance (δR), and the results seem to show that $\delta R = \alpha C^2$ where α is a coefficient depending on the nature of the surroundings. Thus, by determining the resistance of a coil with two different electromotive forces, it would be possible to find the value of α, and hence calculate the value of the resistance when $C = 0$.

THE June number of the Journal of the Institution of Electrical Engineers contains a long paper by Mr. A. T. Snell on the distribution of power by alternate current motors. The paper is followed by a full report of the discussion which it raised when it was communicated to the Institution.

ACCORDING to the *Electrical Review* Messrs. Cross and Mansfield have recently contributed to the Massachusetts Institute of Technology some further experiments on the excursion of the diaphragms of telephones. They find that on increasing the magnetising current, the corresponding permanent deflection increases more and more rapidly in proportion up to about $\frac{3}{10}$ths of an ampère, after which the deflection is very nearly proportional to the current. Similarly the results show that as the strength of the magnet of the telephone increases, the amplitude of the vibration likewise increases up to a certain limit and then falls off. The maximum motion of the diaphragm for a given value of the alternating line current employed is attained before the core reaches half saturation. It also appears that, in general, the amplitude of vibration of the diaphragm increases less rapidly than the current actuating the telephone.

AGRICULTURE is rapidly becoming more scientific. In France the Société Nationale d'Agriculture lately charged a special commission to study the question of agronomic maps, designed to afford the farmer useful indications on the physical and chemical qualities of land, so that he may know how to improve it, what manures to apply, and in what quantity, &c. In an interesting report on behalf of this commission (summarised in *Rev. Gen. de Sciences*) M. Carnot represents that the time is now ripe for production of cantonal and communal agronomic maps, on a large scale; and a number of suggestions are offered as to how the work should be done.

THERE is now a general tendency in Russia to introduce some teaching in agriculture and horticulture into the primary schools. Both private persons and the Provincial authorities freely give grants of land to the schools and to the teachers' seminaries for their fields and orchards, and in many schools the plots of arable land and gardens attended to by the pupils become small centres of agricultural and horticultural education. In Caucasia the same tendency is even more pronounced, and no better idea can be given of the extent of this new movement than by giving the following facts relative to the primary schools of Kuban, a province of Northern Caucasia. This year ten schoolmasters have been invited to attend the lectures upon sericulture and bee-keeping at the schools of the Cossack villages, Armavir and Labinskaya. The inspector of the schools has acquired, with the modest grant of £35, thirty appliances for raising silkworms, and five arrangements for each school for pumping out honey from the beehives, and preparing the artificial wax honeycombs; in addition to which, ten schools have been supplied with apparatus for silkworm culture, while others have been supplied with seeds of plants of special use to bees. All schools which have gardens of silkworm trees have been supplied with seeds of the tree, and 20,000 young trees have been distributed among them. Fourteen schools are expected this year to carry on the silkworm culture, and ten other schools are already carrying on experiments relative to the same.

IN the current number of the *Entomologists' Monthly Magazine*, Mr. R. McLachlan, F.R.S., in an article on the extinction of several species of British butterflies within recent years, and the decadence that appears to be going on with respect to others, suggests the enforcement of a close-time to last continuously during the whole of a series of five or ten years.

IN a recent paper to a Christiania journal on the melting of inland ice (whereby glaciers are prevented from growing indefinitely in thickness, notwithstanding additions above the snow line), Herr Schiotz attempts to estimate the three factors concerned in the interior fusion, viz. earth heat, friction, and pressure, and arrives at the result that a more important agent than any of these (in hindering glacier growth) is solar heat melting the surface ice below the snow line (*Naturw. Rdsch.*, No. 21).

A PARAGRAPH describing a supposed earthquake felt in the Isle of Man on the afternoon of May 5 was published in several London and provincial papers. Mr. Charles Davison writes us to the effect that his inquiries show that the shocks were due, not to earthquakes, but to the firing of heavy guns from a battleship situated near the island.

DURING the cutting of a tunnel at the Notabile Terminus of the Malta Railway (writes Mr. N. Tagliaferro in the *Mediterranean Naturalist*) a piece of lignite, of dimensions about 11 by 4 by 1 inches, was found embedded in the blue variety of the upper globigerina limestone. The upper layers of this limestone appear to be contemporaneous with the Langhian series of the miocene beds of Italy, and were probably deposited on an ascending sea-floor at a depth of nearly 300 fathoms. The discovery of lignite in these beds is, therefore, of some importance.

WRITING in *Science* of May 5, Dr. Morris Gibbs says that the results of observations of the songs of fifty different species of birds shows that the notes do not change in quality as a result of change in emotion. After robbing nests he has waited and listened, allowing ample time for the male to learn of the spoliation. In each instance the male, upon returning to the empty nest, at once burst into song, and though it is possible that the song expressed much sorrow or complaint, Dr. Gibbs could never distinguish any difference between it and the warbling he was accustomed to hear.

IN the *Lancet* of June 10, Dr. Edwin Haward calls attention to a point with respect to proofs of death, which, in consequence of the growth of opinion in favour of cremation, is of great importance. Sir B. W. Richardson and himself had to decide in a particular case whether life was or was not extinct. Of ten tests applied to the body, eight indicated that death was complete. These were (1) heart sounds and motion entirely absent, together with all pulse movement; (2) respiratory sounds and movements entirely absent; (3) temperature of the body the same as that of the surrounding air in the room; (4) a bright needle plunged into the body of the biceps muscle and left there showed no sign of oxidation on withdrawal; (5) intermittent shocks of electricity passed through various muscles and groups of muscles gave no indication whatever of irritability;

(6) the fillet test applied to the veins of the arm caused no filling of veins on the distal side of the fillet; (7) the subcutaneous injection of ammonia caused the dirty brown stain indicative of dissolution; (8) rigor mortis was detected on making careful movements of the joints of the extremities and of the lower jaw. Two tests, however, indicated that life was not extinct. The opening of a vein to ascertain whether the blood had undergone coagulation showed that the blood was fluid. This is not very important, because under abnormal conditions the blood may remain fluid after death has occurred. But a criterion which has been believed to afford sure evidence of life or death was found to fail. It is known as the diaphanous test, and consists in holding the fingers of the supposed dead person in front of a strong light, and looking through the narrow spaces between two fingers just touching one another. The belief has been that if the person is alive a line of scarlet colour will be seen, and that the absence of the colour indicates death. In the case investigated, however, the scarlet line of light between the fingers was clearly visible, though death was assured by the fact that decomposition set in. Further, Sir B. W. Richardson records a case in which the test, applied to the hand of a lady who had simply fainted, gave no evidence of the scarlet line; so that, on that test alone, she would have been declared dead. Thus the diaphanous test, which has been considered by many as infallible, has been proved to be untrustworthy.

HERRN FRIEDLANDER UND SOHN, of Berlin, have issued their *Natural History News*, Nos. 3-9. The lists contain advertisements of recent literature on natural history.

THE Technical Instruction Committee of the Essex County Council have just issued a prospectus containing syllabuses of lectures on chemistry and biology—sciences which are specially applicable to the industries of the county.

Iron has ceased to exist as an independent journal, after living for twenty years under that title and fifty years as the *Mechanics' Magazine*. It has been amalgamated with *Industries*, and the combined journal will in future be issued under the title of *Industries and Iron*.

THE life of Sir Richard Francis Burton, by Lady Burton, will shortly be published by Messrs. Chapman and Hall. The work will recount Sir Richard's life from his birth to his death, and will comprise two volumes of about 600 pages each. A large amount of space is devoted to a description of his explorations.

WE have received the New South Wales Statistical Register for 1891 and previous years, compiled from official returns by Mr. T. A. Coghlan. The volume is a collection of eight parts which have already been issued separately. It is wholly devoted to statistics.

FROM Felix Alcan, of Paris, comes a work on the "Conquête du Monde Végétal," by Louis Bourdeau. The arrangement of the matter in the book is very good. After discussing the general theory of the growth of plants, the author passes to the study of various groups of plants of economic and of ornamental value. This branch of the subject is divided into seven parts. The operations of culture furnish matter for a special chapter, and the book is concluded with an account of the creation and preservation of artificial varieties of some types of plants. To a large extent the subject is treated historically.

THE Life Saving Society has for its chief object the development of instruction in such swimming arts as would be of assistance to a person endeavouring to save life. They have just issued a revised edition of an excellent little handbook in which an account is given of the methods recommended by the society for the rescue of the drowning and the resuscitation of the apparently drowned. It is hoped that the issue of this course of instruction will lead to the subject of life-saving and resuscitation being included in the curriculum of every school.

THE decomposition of steam by means of heated magnesium makes, according to Herr Rosenfeld (*Berichte*), a pretty lecture experiment. A short piece of a combustion tube is furnished at one end with a stopper and tube for escape of gas, and connected at the other with a vessel containing water. A little powdered magnesium (0·5 to 1 gramme) is put in the tube, and cautiously heated; then, by gently heating the water, steam passes over, and the metal merely glows. In this way is obtained a steady current of hydrogen, which can be collected over water. But if a rapid current of steam is sent over the heated metal, the latter burns with dazzling light, and the heat breaks the tube. This occurs, however, only after some time, when a good deal of hydrogen has been collected in the bell-jar.

AN interesting compound of aluminium chloride with benzoyl chloride, the chloride of the benzoic acid radicle, has been obtained in large crystals by M. Perrier, and an account of it is contributed to the current number of the *Comptes Rendus*. Such compounds are of particular importance in view of the remarkable *rôle* which aluminium chloride has been found to play in synthetical chemistry, as affording some insight into the nature of the intermediate reactions upon which the apparently catalytic action of this useful salt depends. The new compound now described is represented by the formula $C_6H_5COCl.AlCl_3$, or, if aluminium chloride is considered as represented by the usual double formula, $(C_6H_5COCl)_2.Al_2Cl_6$. It is readily prepared by heating about ten grams of benzoyl chloride dissolved in 150 c.c. of carbon bisulphide with nine grams of anhydrous aluminium chloride in a flask fitted with a reflux condenser. After three hours' ebullition and subsequent cooling a large yield of the colourless tabular crystals of the new compound is obtained. The crystals decompose somewhat rapidly in moist air, and they are instantly decomposed by water, forming an aqueous solution of aluminium chloride, hydrochloric acid, and benzoic acid. They are readily soluble, however, without decomposition, in carbon bisulphide. The formation of compounds of this nature is not confined to the chloride of benzoic acid, but would appear to be general throughout the aromatic series, and M. Perrier has already isolated in a pure state the corresponding compound containing the chloride of phthalic acid. Moreover, in the fatty series the chloride of butyric acid is found to combine readily with aluminium chloride, in carbon bisulphide solution, to form a compound of the same definite nature.

THESE compounds are not the first of the kind that have been prepared. Last year MM. Perrier and Louise described a considerable number containing the aromatic ketones, ethers, and phenols. They were all constituted upon the same type, $M_2.Al_2Cl_6$, where M represents a molecule of a ketone, ether, or phenol. The compound containing acetophenone, for instance, $(C_6H_5.CO.CH_3)_2.Al_2Cl_6$, may be obtained in good crystals by cooling the liquid formed by heating acetophenone dissolved in carbon bisulphide with aluminium chloride to 40°. Similarly the compound with phenyl benzoate, $(C_6H_5.COOC_6H_5)_2.Al_2Cl_6$, crystallises from the liquid obtained by heating the components in carbon bisulphide solution. They are all of the same character, permanent in carbon bisulphide solution or in dry air, but decomposed rapidly by moisture.

THE formation of the above compounds explains at once the important synthetical method introduced by MM. Friedel and Crafts for the preparation of the aromatic ketones by the action of the hydrocarbons upon the chlorides of the acid radicles in presence of aluminium chloride. It is most probable that a compound of aluminium chloride with the chloride of the acid radicle, $(R.COCl)_2.Al_2Cl_6$, is first formed, and that this is subsequently converted by the hydrocarbon into the compound of aluminium chloride and the ketone, $(R.CO.R)_2.Al_2Cl_6$, with elimination of hydrochloric acid. Under the conditions of the experiment this latter compound is dissociated into free aluminium chloride and the free ketone. That this explanation is very near the truth is demonstrated by the fact that by working in carbon bisulphide solution, M. Perrier has actually converted his new compound with benzoyl chloride, $(C_6H_5COCl)_2.Al_2Cl_6$, directly into the ketone compound, $(C_6H_5.CO.C_6H_5)_2.Al_2Cl_6$, by reacting upon it with benzene. The crystals of the ketone compound obtained were identical with those prepared from benzophenone itself.

WE regret that in announcing the birthday honours last week the name of Mr. Daniel Morris was printed "Mr. David Morris."

NOTES from the Marine Biological Station, Plymouth.—Last week's captures include the Actinian *Chitonactis coronata*, the Polychæta *Glycera capitata* and *Procerœa picta*, the Opisthobranchs *Candiella plebeia* and *Triopa claviger*, the Schizopod *Leptomysis mediterranea*, the Ascidian *Pycnoclavella aurilucens* and a number of *Amphioxus lanceolatus*. The character of the floating fauna has exhibited little change since the preceding week, Ctenophora and Leptomedusæ having been especially abundant. The following animals are now breeding: Various Serpulidæ, the Schizopoda *Schistomysis arenosa* and *Leptomysis mediterranea*, the Decapod *Crangon sculptus*, and the Ascidian *Botryllus violaceus*. The majority of *Amphioxus* also are full-grown and mature.

THE additions to the Zoological Society's Gardens during the past week include a Stair's Monkey (*Cercopithecus stairsi*, ♂) from East Africa, presented by Mr. F. Hintze; a Himalayan Bear (*Ursus tibetanus*, ♂) from Northern India, presented by Capt. Michael Hughes, 2nd Life Guards; a Maugés Dasyure (*Dasyurus maugæi*) from Australia, presented by Mr. Robert Hoade; four South Island Robins (*Miro albifrons*) from New Zealand, presented by Capt. Edgar J. Evans; two Carrion Crows (*Corvus corone*), British, presented by the Hon. Wm. Edwardes; a Rose-crested Cockatoo (*Cacatua moluccensis*) from Moluccas, presented by Mr. J. B. Sutherland; a Herring Gull (*Larus argentatus*) British, presented by Miss M. A. Croxford; a Long-eared Owl (*Asio otus*), a Tawny Owl (*Syrnium aluco*), British, presented by Mr. Alan F. Crossman; two Horned Lizards (*Phrynosoma cornutum*) from Texas, presented by Mr. A. E. Jamrach; a Red-handed Tamarin (*Midas rufimanus*) from Surinam, a Yellow-footed Rock Kangaroo (*Petrogale xanthopus*, ♂) from South Australia, fourteen Horned Lizards (*Phrynosoma cornutum*) from Texas, four Tuberculated Iguanas (*Iguana tuberculata*) from the West Indies, deposited; a Malbrouck Monkey (*Cercopithecus cynosurus*) from West Africa, four Bronze-winged Pigeons (*Phaps chalcoptera*), two Australian Sheldrakes (*Tadorna tadornoides*, ♂ ♀) from Australia, four Green Waxbills (*Estrelda formosa*) from India, purchased; a Vervet Monkey (*Cercopithecus lalandii*), a Japanese Deer (*Cervus sika*, ♀) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

FINLAY'S COMET (1886 VII.).—The ephemeris of Finlay's comet for this week is as follows:—

12h. *M. T. Paris.*

1893.		R.A. (app.) h. m. s.		Decl. (app.) ° ′
June 15	...	1 45 47	...	+ 8 2·9
16	...	50 31	...	8 31·2
17	...	1 55 15	...	8 59·1
18	...	2 0 0	...	9 26·8
19	...	4 45	...	9 54·2
20	...	9 30	...	10 21·3
21	...	14 16	...	10 48·1
22	...	2 19 1	...	+11 14·5

DETERMINATIONS OF GRAVITY.—The Appendix (No. 15) of the report of the "United States Coast and Geodetic Survey for 1891" contains a set of determinations of gravity made with half-second pendulums on the Pacific coast, in Alaska, and at Washington, D.C., and Hoboken, N.J., under the superintendence of Mr. T. C. Mendenhall. On account of the difficulty and cost of a previous undertaking, the apparatus in the present determinations has been greatly reduced both in magnitude and complexity by using a pendulum vibrating to half a second and a chronometer in place of a clock. The pendulum apparatus consisted of a set of three quarter metre pendulums, a dummy or temperature pendulum, an air-tight receiver in which the pendulums were swung, a flash apparatus, wherein an electromagnet in the circuit of a chronometer moves a shutter and throws out a flash of light each second, a telescope for observing, mounted above the flash-light apparatus and various accessories. The pendulums themselves constituted a set of three, so that discrepancies in any one of them, if they appeared, could easily be detected. Each was composed of an alloy of aluminium 10 per cent. and copper 90 per cent., a composition highly resistible to corrosion. The base station adopted was at the Smithsonian Institution in Washington, and the value assumed there for g was 980·10 dynes.

The following are the values of g as obtained at five places, a table given here including several other determinations:—

Station.	Lat. N.	Long. W. of Greenw.	Elev. above sea-level. Feet.	g at station. Dynes.	g reduced to sea-level. Dynes.
	° ′	° ′			
Washington, D.C.	38 53	77 02	34	[980 1000]	980·1020
San Francisco, Cal.	37 47	122 26	375	979 9507	979·9727
Seattle, Wash.	47 36	121 20	243	980·7116	980·7258
Mount Hamilton, Cal. Lick Observatory	37 20	121 39	4205	979 6456	979·8920
Hoboken, N.J.	40 44	74 02	35	980·2555	980·2576

SOLAR OBSERVATIONS AT THE ROYAL COLLEGE, ROME.—In the *Memorie della Società degli Spettroscopisti Italiani* Prof. Tachini communicates the observations of the sun made at the Royal College Observatory during the first trimestre of this year. The records of the protuberances during this period show that the monthly numbers were 138, 198, 264, a rapid increase, as will be noticed, the maxima heights being 1026″, 1149″, and 1650″ respectively for the same months. The mean altitudes increased also rather irregularly, 706″, 824″, and 1103″ being the numbers given. With regard to the spots, March contained the most numerous (358), being 94 more than January and 73 more than February. The number of groups for the first two months were, curiously enough, nearly equal (the numbers being 101 and 102), but the extensions were very different, 1968 and 2215 representing the numbers for the spots, and 870 and 1170 for the faculæ. The same number of these memoirs gives a summation of the solar observations made at the Royal Observatory at Palermo during the year 1892 by M. T. Lona and A. Mascari, and M. Abetti's observations of the conjunction of Mars with υ Tauri, and of Saturn with γ Virginis.

L'ASTRONOMIE FOR JUNE.—The opening article in this month's number contains a description of a very remarkable observation on Jupiter made by M. Lumsden on September 20, 1891. It seems that he has seen the shadow of the first satellite of Jupiter on the planet's surface, accompanied and followed by a second shadow, not so dark and sharp as the original satellite, but nevertheless very distinct and incontestable. This second shadow is said to have moved uniformly with the real one, following it at an equal distance. The observer seems to be very certain that it was not a spot, so the question is—How can this secondary shadow be explained? It was thought at first that as the other satellites were all on the same side of the primary it might have been one of their shadows, but the facts show that that was not the case. M. Lumsden suggested that perhaps it was the shadow of Satellite 1 cast by the light emitted by Satellite 4, assuming the fourth satellite to be self-luminous, but M. Flammarion's explanation is perhaps more simple, it being that since the atmosphere of Jupiter is very deep, the clouds would be at various depths, and at great distances from one another, so that sometimes the shadow of a satellite would fall either on the upper or on the lower clouds, or even on the disc itself. It is true that the distance between these shadows would be very small as seen from